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Subject: Probability ditribution of mass constraint fitting in oct14 vs. mar15

Posted by [Lu Cao](#) on Tue, 07 Jul 2015 13:25:13 GMT

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Dear all,

I simulated 2k evt of this decay chain:

pbarp->Ds+ Ds-; Ds- -> K+K-pi-; Ds+ -> eta e+ nu\_e; eta -> pi+ pi- pi0; pi0->2 gamma.

Inorder to reconstruct eta, I do mass constraint fitting on (pi+, pi- pi0) after the vtx fitting of combined charged daughters. Recently I find the probability distribution of the eta mass constraint fitting seems incorrect, where most of prob are skewed to 1 and chi2 is very small, i.e. the mean value of chi2 is 0.0003. The interesting thing is this doesn't happen in the mass constraint fittings of Ds- (pure charged daughters) and pi0 (pure neutral daughters). This problem is found with the release mar15 (#27529). I test the identical code with release oct14 (#26514), and find this problem doesn't arise there (see attached histograms). The code I used for testing is attached.

Question: Why it happens and how can I fix it?

Many thanks in advance.

Best regards,

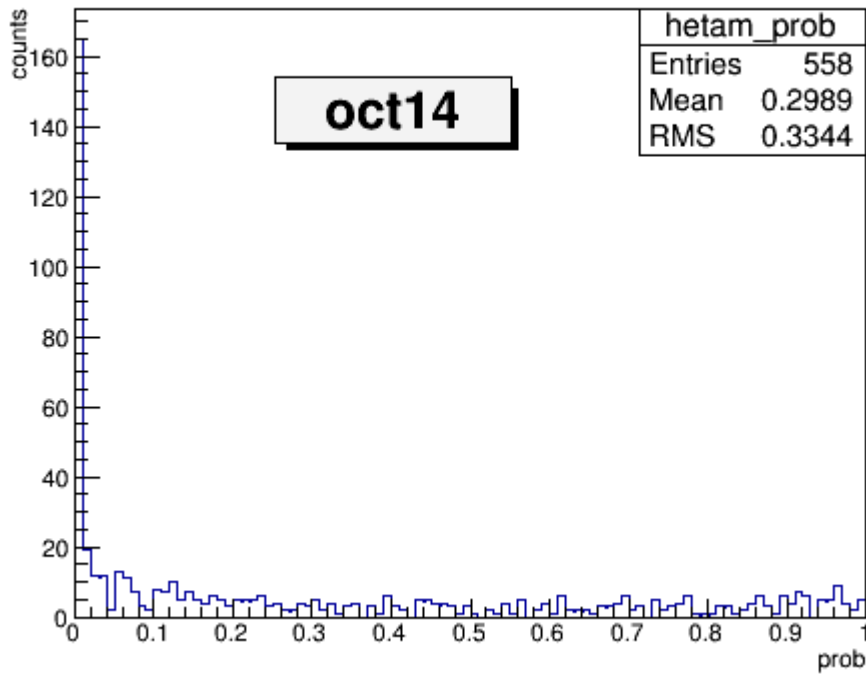
Lu

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### File Attachments

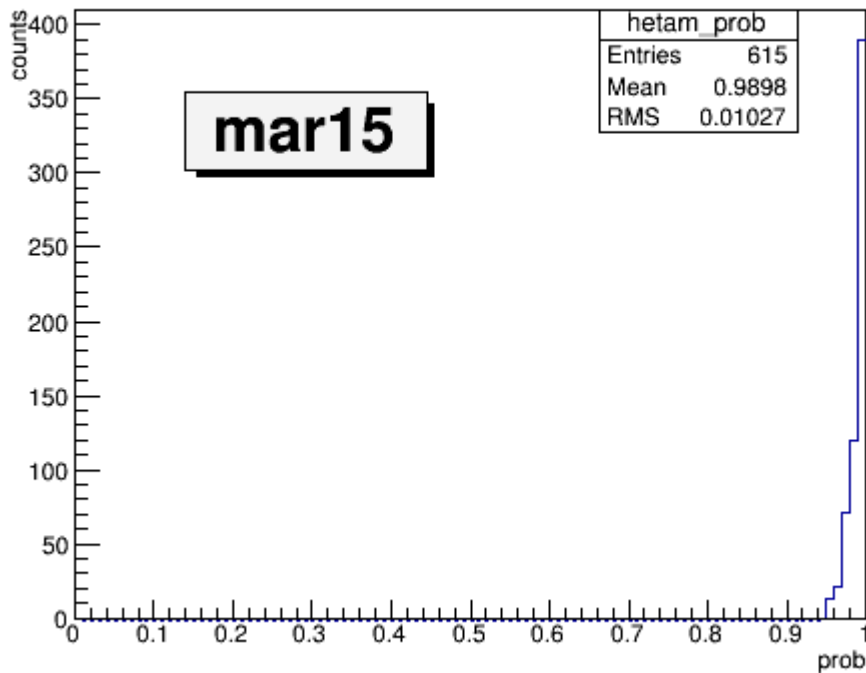
- 1) [dspair.dec](#), downloaded 416 times
- 2) [sim\\_complete.C](#), downloaded 420 times
- 3) [digi\\_complete.C](#), downloaded 364 times
- 4) [reco\\_complete.C](#), downloaded 398 times
- 5) [pid\\_complete.C](#), downloaded 389 times
- 6) [oct14.png](#), downloaded 641 times

Chi2 probability distribution of  $\eta$  mass constraint fit



7) [mar15.png](#), downloaded 726 times

Chi2 probability distribution of  $\eta$  mass constraint fit



8) [up\\_mcf\\_neu\\_recon.C](#), downloaded 395 times

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Subject: Re: Probability ditribution of mass constraint fitting in oct14 vs. mar15  
Posted by [StefanoSpataro](#) on Wed, 08 Jul 2015 08:47:13 GMT

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You forgot to attach the analysis macro.

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Subject: Re: Probability ditribution of mass constraint fitting in oct14 vs. mar15  
Posted by [Lu Cao](#) on Wed, 08 Jul 2015 11:02:25 GMT  
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Sorry, I forgot. I attach it now within the first message.

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